REPORT

ON THE CHRONOMETER TRIED AT THE

OBSERVATORY OF NEUCHATEL

REPORT

OF THE DIRECTOR OF THE

CANTONAL OBSERVATORY OF NEUCHATEL

TO THE DEPARTMENT OF THE INTERIOR

ON THE

COMPETITIVE TRIAL OF CHRONOMETERS

DURING THE YEAR 1875

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Sir,

Notwithstanding the prolonged crisis which depresses at this time the horological industry of our country, the number of chronometers sent to the Observatory has been considerable, namely 270; 231 of which have obtained official bulletins as to their rate, while 39 were sent back to the manufacturers because their adjustment did not satisfy the conditions of the regulations.

While thus the number of watches which have stood the trial is not much smaller than that of last year, there is a notable improvement in their quality; for, not only has the mean of the principal variations sensibly diminished, but those watches which have taken prizes, have shown an astonishing perfection of rate, equal to that of an astronomical clock.

As usual I shall begin with the statistics of the chronometers observed, showing the progress which has been made as well as the defects which still exist and hoping to be able to furnish, in the course of time, such valuable information as will point out the advantages or disadvantages of certain particular constructions.

First, then, as to the places where they have been manufactured, we notice again an increase in the number of watches sent from Chaux-de-Fonds. Les Brenets too, occupies this time the third rank. The following is the order in which they stand according to the number they have sent :—

Locle	has sent		134
La Chaux-de-Fonds	»	»	41
Les Brenets	»	»	31
Neuchatel	»	»	15
Les Ponts	»	»	9
Fleurier	»	»	1

Total 231 chronometers.

The order in which they arrange themselves according to the four classes is about the same as last year. We have :—

Class A, marine chronometers observed during	2 months,	4
» B, pocket » » » 6 weeks,		29
» C, » » » » 1 month,		119
» D, » » » » 15 days,		79

231

Tables *I* to *IV*, appended to this report, give the list of all the chronometers of these four categories in the order of the regularity of their rate with a summary of their results observed. We mention in explanation of these tables that all the watches not otherwise indicated in the last column, are stem winders, and that, with the exception of the marine chronometers, six only have fusees.

On examining these tables we see at once a decided progress in that the mean daily variation has sensibly diminished for all the four categories, except for the marine chronometers, and here even the mean variation, 0.32 of a second, has increased only by the fact that one of the four was less perfect in its adjustments If we leave this one out, the mean variation of this class will be only 0.14 of a second, *i.e.*, much less than the corresponding mean of 1874.

The following are their mean variations :—

Class *A*, 4 marine chronometers. observed 2 months, show a
mean variation of . . . 0ˢ.32 (0ˢ,20 in 1874)

» *B*, 29 pocket chronometers, ob-
served 6 weeks. show a
mean variation of . . . 0ˢ.41 (0ˢ,44 » »)

» *C*, 119 pocket chronometers. ob-
served 1 month, show a
mean variation of . . . 0ˢ.46 (0ˢ.55 » »)

» *D*, 79 pocket chronometers, ob-
served 15 days, show a
mean variation of . . . 0ˢ.49 (0ˢ.55 » »)

The 231 chronometers show a general mean daily variation of 0ˢ.46 (0ˢ.53 in 1874).

For the first time the mean variation of all the chronometers falls below half a second. Ten years ago it was still more than

a second. This year the variation of only 2 °/₀ of the watches
observed has reached this figure. The table arranged according
to the different escapements which we are about to give, will
show the progress our artificers are making from year to year.

I may mention that, while the lever chronometers are, as
usual, in the majority, and the escapement with bascule
comes next in order of frequency, we have this time received
but two with spring detent escapements and both of them are
marine chronometers. On the other hand we have received,
for the first time, two watches with Robins's escapement. We
have observed :—

155 chronometers with anchor escapements, giving a mean
      variation of 0ˢ.46
 64 chronometers with bascule escapements, giving a
      mean variation of 0ˢ.47
  8 chronometers with tourbillon escapements, giving
      a mean variation of 0ˢ.49
  2 chronometers with spring detent escapements,
      giving a mean variation of 0ˢ.17
  2 chronometers with Robins's escapements, giving a
      mean variation of 0ˢ.62

Omitting the last two in this table, which are represented by
too small a number of watches, we see that the difference in
the regularity of the rate obtained by different escapements is
very small, a fact which we have noticed in previous trials.
The following comparative table of the mean variations of
different escapements observed during the past years will show
this :—

| YEAR | ESCAPEMENTS | | | | MEAN |
	Anchor.	Bascule.	Spring detent.	Tourbillon.	variation of the year.
1862	$1^s.51$	$1^s.80$	$1^s.02$	$2^s.30$	$1^s.61$
1863	1 .39	1 ,28	1 ,37	0 ,64	1 .28
1864	1 .14	1 .47	1 .17	0 ,66	1 .27
1865	0 .89	1 ,01	0 .70	0 .42	0 ,88
1866	0 .67	0 ,73	1 ,01	0 .35	0 ,74
1867	0 .70	0 .61	0 .74	0 .52	0 ,66
1868	0 .57	0 ,56	0 ,66	0 .29	0 ,57
1869	0 ,61	0 ,58	0 ,60	0 ,55	0 ,60
1870	0 ,53	0 ,62	0 .52	0 ,40	0 ,54
1871	0 ,56	0 .53	0 .47	0 .56	0 ,55
1872	0 ,53	0 ,46	0 ,54	0 .58	0 ,52
1873	0 ,62	0 .63	0 .56	0 ,72	0 ,62
1874	0 ,54	0 ,52	0 .48	0 ,60	0 ,53
1875	0 .46	0 ,47	0 .17	0 .49	0 ,46
Mean variation during 14 years	$0^s,601$	$0^s.745$	$0^s.706$	$0^s.706$	$0^s,652$
Number of chronometers . . .	1048	462	137	57	1704

Nor is there any very great difference observable in the mean daily rates if we classify the watches observed according to the different hairsprings employed in them; for, if this year. as well as last, the cylindrical spring with Phillips's terminal curves shows the least. and the ordinary cylindrical one the greatest variation, the ordinary flat Breguet spring surpasses the one with theoretical curves in its results, though, as will be seen, the difference is not very great. The following are the results we have observed :—

27 chronometers with Breguet springs 0ˢ.44

133   »   »   flat   »   with one theo-
        retical curve 0ˢ.46

35 chronometers with flat springs with two theoreti-
        cal curves 0ˢ.47

14 chronometers with cylindrical spring with Phil-
        lips's terminal curves 0ˢ.42

4 chronometers with ordinary cylindrical springs .   0ˢ.50

18   »   »   spherical hairsprings 0ˢ.49

231 chronometers with a mean daily variation of . . .   0ˢ.46

In different positions however the hairspring seems to have
more influence on the rate, for the variation between hanging
and lying are the following : —

For   13 chronometers with flat Breguet spring . . .   2ˢ.24

  »   78   »   »   »   «   »   with
        single theoretical curve 1ˢ.75

  »   31 chronometers with flat springs with double
        theoretical curves 2ˢ.52

  »   9 chronometers with cylindrical springs with
        double theoretical curves 2ˢ.63

  »   3 chronometers with ordinary cylindrical springs   0ˢ.87

  »   14   »   »   spherical springs 1ˢ.54

For 148 chronometers giving a mean variation between
hanging and lying of 1ˢ.97

While this mean variation is considerably smaller than that
of last year, we notice that,—leaving out the three with ordin-
ary cylindrical ones,—the spherical hairspring shows, like last
year, the least variation between hanging and lying. On the
other hand, the flat spring with double terminal curves occupies
this time the last rank, while before it had held the first. The
following table will show that for the last five years the differ-
ences of the mean rates are smaller; nevertheless the flat hair-
spring with double terminal curves has fallen to the second rank.

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YEARS	Flat Breguet hairspring		Flat Phillips's hairspring		Flat spring with double curves of Phillips		Cylindrical hairspring of Phillips		Ordinary cylindrical hairspring		Spherical hairspring		General mean	
	Daily variation	Variation between hanging & lying	Daily variation	Variation between hanging & lying	Daily variation	Variation between hanging & lying	Daily variation	Variation between hanging & lying	Daily variation	Variation between hanging & lying	Daily variation	Variation between hanging & lying	Daily variation	Variation between hanging & lying
1871	0s,54	2s,05	0s,54	2s,00	—	—	0s,44	0s,41	0s,68	1s,45	0s,68	—	0s,55	1s,90
1872	0,55	2,42	0,51	1,97	0s,50	0s,67	0,51	2,34	0,63	2,81	0,53	2s,43	0,52	1,99
1873	0,54	2,36	0,64	2,62	0,43	1,63	0,61	3,07	0.58	—	0,79	3,99	0,62	2,59
1874	0,46	2,32	0,56	2,41	0,49	1,78	0,41	2,18	0,57	2,61	0,60	1,30	0,53	2,27
1875	0,44	2,24	0,46	1,75	0,47	2,52	0,42	2,63	0,50	0,87	0,49	1,54	0,46	1,97
Mean of the 5 years	0s,48	2s,27	0s,54	2s,17	0s,48	2s,00	0s,49	2s,29	0s,61	2s,16	0s,53	1s,70	0s,53	2s,15
Number of chronometer	71	33	656	443	80	69	68	34	50	29	27	21	952	629

Is it because our artificers are not always conscientious in making the veritable theoretical curves? At least we are tempted to think so when we meet the same inferior results from this spring, in the watches which have been observed in five positions and during a course of six weeks, of which the following are the variations :—

Form of hairspring	Number of chrono-meters	VARIATION				Sum of the four variations
		between hanging and lying	between hanging & pend^t to left	between hanging & pend^t to right	dial up and dial down	
Flat Phillips's spring . . .	17	1^s,42	2^s.57	1^s,66	1^s,28	6^s,93
Flat spring with double curves of Phillips	7	2 ,01	4 ,09	1 ,77	4 ,01	11 ,88
Cylindrical spring with Phillips curves	1	2 .64	1 ,82	0 .62	1 ,19	6 ,27
Ordinary cylindrical spring .	1	0 .77	2 ,28	0 .38	0 .99	4 .42
Spherical spring	3	1 .78	1 .22	1 .64	3 ,28	7 ,92
Mean. . . .	29	1^s.62	2^s.76	1^s.60	2^s,13	8^s,42

The sum of the four variations, which last year was 7.43 seconds, has increased somewhat, owing to the bad results furnished by the flat spring with double curves. While for all the other forms of hairsprings we notice some progress from year to year since 1873, the time at which we commenced to observe them in five positions, the contrary is the case with the flat spring with double terminal curves, which gave :—

in 1873 for the sum of the four variations   5^s.79
» 1874   »   »   »   »   6^s.80
» 1875   »   »   »   »   11^s.88

The three forms of hairsprings which have been employed in a sufficient number of watches to furnish reliable data show, for the three last years, very nearly the same result; the mean of the sum of the four variations is : —

for 42 watches with flat hairsprings, Phillips's single curves . . 8^s.08
» 22   »   »   »   »   »   double   »   . . 8^s.24
» 9   »   » cylind^l »   »   »   »   . . 8^s.02

· Evidently more time is needed yet to decide which form of hairspring is the most favorable to isochronism.

The compensation of the balance, or the adjustment to heat and cold, is very satisfactory : for the 167 chronometers which have been tested in the oven give a mean variation of 0.13 of a second per degree centigrade of temperature.

For 5 chronometers = 3 % the variation per degree was . . . 0^s.00
» 80   »   = 48 %   »   »   » below 0^s.1
» 120   »   = 72 %   »   »   »   »   0^s.2
» 150   »   = 90 %   »   »   »   »   0^s.3
» 17   »   = 10 %   »   »   exceeds . 0^s.3

I have to add, as in previous reports, that the majority of the watches are over compensated : this time the number of them is 104, while there are 58 whose compensation is insufficient. In general they resume pretty nearly their previous rate after the test in the oven, for the mean of the rate differs only by 1^s.07 between before and after the oven.

In order to show the progress made by our artists in the adjustment of watches, I have arranged the following table giving for a number of consecutive years the three principal results observed :

VARIATION

Years.	of daily rate	between hang ing and lying	for 1° of temperature
1864	1^s.27	8^s.21	0^s.48
1865	0 .88	6 .18	0 .35
1866	0 .74	3 .56	0 .36
1867	0 .66	3 .57	0 .16
1868	0 .57	2 .44	0 .15
1869	0 .60	2 .43	0 .14
1870	0 .54	2 .37	0 .14
1871	0 .55	1 .90	0 .13
1872	0 .52	1 .99	0 .15
1873	0 .62	2 .59	0 .15
1874	0 .53	2 .27	0 .15
1875	0 .46	1 .97	0 .13

We see in fact that the results of 1875 are superior to those of the preceding years. The same is the case in regard to the difference between the maximum and minimum daily rates, for we have in 1875 :—

For those of category A. observed during two months   3^s.23

» » B. » » six weeks . 6^s.22

» » C. » » one month . 5^s.75

» » D. » » fifteen days 3^s.71

For the 231 chronometers the mean of . . . . 5^s.07

And the difference between the rate of the first and that of the last week. showing whether it maintains itself the same or not is this time :—

For the marine chronometers after an interval of 2 months 2^s.11

» pocket » » » 6 weeks 1^s.57

In the mean 1^s.64

The statistics which we have just given prove the high degree of perfection to which our national industry has been carried. If the Observatory, with its annual competitive trials, has greatly contributed to the development of our chronometry, the reorganization of the hour signal service, which we have just completed, in furnishing more regularly than heretofore to all the principal centers of the watch making districts the correct astronomical time, cannot fail to stimulate our artists in the difficult work of adjusting, and must contribute to the progress of the horological industry of our country.

In directing our attention to those chronometers which have been successful in the winning of the prizes awarded by the State, we are happy to say that among the four marine chronometers, there are three which satisfy the conditions of the regulations, and that the first on the list, No. 94, manufactured by Hᵣᵢ Grandjean and Co. of Locle, is a veritable phenomenon, surpassing in the regularity of its rate No. 92 of the same makers, which took a prize last year. In fact the daily variation of No. 94 is not more than 0.08 of a second, which is the variation of a good astronomical clock, and, though the difference between the daily rate of the first and the last week (0ˢ.57) exceeds that of No. 92, the difference between its maximum and minimum rate (0ˢ.94) is less. If we determine its rank according to the method at Greenwich, we shall see that it is superior to all the rest, since the characteristic number for its rank would only be **8ˢ.90**, while that for No. 92 was **11ˢ.11** and for the one which held the first rank at Greenwich **13ˢ.08.**

If, as may be fairly expected, this chronometer maintains its rate, it will certainly rival the best English or American make at the Philadelphia exposition, to which its owner intends to send it. A ship chronometer with a mean variation of 0.08 of a second is certainly a masterpiece : but what is perhaps more

astonishing is the fact that pocket chronometers, such as figure at the head of tables II and III, have been perfected to such a degree that their mean variation does not exceed 0.13, 0.14, 0.16 and 0.17 of a second. Certainly, only a few years ago such perfection would have been regarded as unattainable.

It is hardly necessary to say that the three watches at the head of table II well deserve the prizes awarded for chronometers of this category: I would merely suggest that No. 5250, manufactured by Ulysse Nardin, with its mean variation of 0.14 of a second, deserves the precedence over No. 24036, manufactured by Mr. Breting, whose mean variation is 0.13 of a second, because it has shown less difference between its rate of the first and that of the last week. (See art. 9 of the regulations.)

Similarly, article 10 of the regulations, (according to which, « if two or more watches have the same mean daily variation, or the same within 0.02 of a second, the first rank will be given to the one showing the least difference between its maximum and minimum daily rate, »), will explain the order in which the first chronometers in table No. III follow each other; the result is that the first prize of this category will be taken by No. 80643, manufactured by Mr. Girard-Perregaux, the second by No. 54025, manufactured by Messrs. Borel and Courvoisier, and the third by No. 2235, manufactured by Mr. Paul Mathey-Doret.

As Nos. 5, 6 and 7 of the table are excluded from the competition notwithstanding their small daily variations, because their variation between hanging and lying exceeds the limit (3 seconds) prescribed by the regulations, the fourth prize must be given either to No. 4 or No. 8 of the table; but, since their mean variation is the same within 0.02 of a second, the article quoted will decide in favor of No. 8877, manufactured by Mr.

Ed. Perregaux. because the difference between the extremes of its rate is less.

According to the above remarks and agreeably to the regulations concerning these competitive trials. I have the honour, Sir, to propose that the prizes be awarded to the following eight chronometers. whose full rate will be found in tables V to XII. .

First prize of 150 *francs.* to marine chronometer No. 94, of *H. Grandjean and Co.,* *of Locle.*

Second prize of 130 *francs* to pocket chronometer No. 3817, manufactured by *Ulysse Nardin. of Locle.*

Third prize of 120 *francs.* to pocket chronometer No. 5250. manufactured by *Ulysse Nardin, of Locle.*

Fourth prize of 110 *francs,* to pocket chronometer No. 24036. manufactured by *Ulysse Breting, of Locle.*

Fifth prize of 100 *francs,* to pocket chronometer No. 80643. manufact^d by *Girard-Perregaux, of Chaux-de-Fonds.*

Sixth prize of 80 *francs,* to pocket chronometer No. 54025. manufactured by *Borel and Courvoisier, of Neuchatel.*

Seventh prize of 60 *francs,* to pocket chronometer No. 2235. manufactured by *Paul Mathey-Doret, of Locle.*

Eighth prize of 50 *francs,* to pocket chronometer No. 8877, manufactured by *Edouard Perregaux, of Locle.*

In closing this report I would express the hope that the development of our chronometry will receive a new impulse by the offer of an additional prize which the Government has voted for the best mean of all the chronometers of one manufacturer observed during a year, and which will be awarded this year for the first time.

I am, Sir, yours very respectfully

Dr. Ad. HIRSCH,

Director of the Cantonal Observatory.

Neuchatel, January 8th, 1876.

A. — MARINE CHRONOMETRES
observed during two months and in the oven.

Number of crank	NAMES OF MANUFACTURERS AND PLACE OF RESIDENCE	Numbers of chronometers	Kind of escapement	Form of balancing	Cases	Mean daily rate	Mean daily variation	Variation for 1° of temperature	Difference before and after the oven	Difference between the extremes of rate	Difference in the rate of the first and last week	REMARKS
1	Henri Grandjean et Cie au Locle	94	spring detent	cyl. Ph.	fusee	— 0.84	± 0.18	0.0?	— 0.10	0.0?	+ 0.5?	adjusted by Kaurup, going 56 hours
2	Rosa Klimack, pupil of the school of horlogery, Loch	1875	bascule	cyl. Ph.	fusee	— 0.72	0.15	0.12	— 0.45	1.86	— 0.84	presented to Grossmann, director of the school of horlogery
3	Association ouvrière au Locle	91	spring detent	cyl. Ph.	fusee	— 3.86	0.20	— 0.02	— 1.22	3.31	— 2.72	
4	E. Bob et Maret aux Ponts	5691	bascule	cyl.	fusee	+ 2.61	0.78	0.20	— 0.59	0.42	— 5.32	adjusted by Bargstedt

B. — POCKET CHRONOMETRES
observed during six weeks in five positions and in the oven.

Number of crank	NAMES OF MANUFACTURERS AND PLACE OF RESIDENCE	Numbers of chronom.	Kind of escapement	Form of balancing	Mean daily rate	Mean daily variation	Variation for 1° of temperature	Difference before and after the oven	Difference between hanging and lying	Variation between hanging and pendant to the left	Variation between hanging and pendant to the right	Variation between dial up and dial down	Difference of rate between the first and last week	Difference between the extremes of rate	REMARKS
1	Ulysse Nardin au Locle	3817	anc.	0. Ph.	— 1.03	0.14	+ 0.00	0.0	— 0.84	+ 1.10	+ 2.31	— 1.93	— 0.07	3.8	adjusted by Kaurup
2	Ulysse Nardin au Locle	5234	anc.	0. Ph.	— 1.05	0.14	0.04	— 0.3	+ 0.30	1.74	2.11	— 0.23	— 0.38	2.0	» Kaurup
3	Ulysse Breting au Locle	24101	bascule	0. Ph.	— 0.11	0.13	0.30	0.0	— 2.75	1.79	0.05	— 1.07	5.1	» Bargstedt
4	Edouard Perregaux au Locle	8808	anc.	0. Ph.	0.23	0.72	— 0.13	— 0.1	0.50	1.37	1.51	1.04	1.01	3.3	» Bargstedt
5	Borel et Courvoisier à Neuchâtel	65059	anc.	d. Ph.	— 1.59	0.24	— 0.02	— 0.7	0.18	3.82	2.57	— 0.15	2.22	4.0	» Bargstedt
6	Ulysse Nardin au Locle	5092	anc.	d. Ph.	— 1.86	0.26	0.06	— 0.1	1.28	2.74	0.74	— 0.64	1.05	5.7	» Kaurup
7	Borel et Courvoisier à Neuchâtel	65025	anc.	0. Ph.	— 0.84	0.24	— 0.01	1.5	0.92	2.50	2.39	— 1.37	1.52	6.3	» Bargstedt
8	Breting frères au Locle	45041	anc.	d. 2 c. Ph.	— 2.12	0.29	— 0.03	0.5	1.15	0.91	1.92	0.70	0.72	3.2	» Jacot, with key
9	A. Huguenin et fils au Locle	16280	anc.	H. Ph.	— 0.17	0.33	— 1.10	2.4	2.15	1.05	0.25	— 0.50	— 1.20	3.3	» Bargstedt
10	Ulysse Breting au Locle	25512	anc.	0. Ph.	— 0.57	0.31	1.06	1.8	1.00	0.91	0.54	1.00	— 0.55	8.8	» Bargstedt
11	Breting frères au Locle	47812	anc.	0. Ph.	— 2.28	0.31	— 0.17	0.5	1.01	2.21	1.75	— 0.42	— 0.37	3.5	» Bargstedt
12	Ulysse Nardin au Locle	5645	anc.	0. Ph.	— 0.93	0.53	— 0.47	1.0	3.63	3.86	2.14	1.78	— 0.55	4.5	» Kaurup
13	Ed. Huguenin-Court. au Locle	360	bascule	0. Ph.	— 2.38	0.36	0.07	0.8	1.13	0.55	2.10	— 3.53	0.21	7.7	» Kaurup
14	Ulysse Nardin au Locle	5665	anc.	0. Ph.	1.04	0.55	— 0.03	— 0.1	0.25	0.68	3.81	2.80	— 2.27	4.0	» Kaurup
15	Borel et Courvoisier à Neuchâtel	65058	anc.	0. Ph.	0.07	0.40	— 0.02	0.0	1.85	3.78	4.98	0.87	1.45	7.6	» Bargstedt
16	Girard Perregaux à la Chaux-de-Fonds	74684	bascule	spherical	— 3.51	0.50	— 0.17	3.0	5.01	0.42	1.00	1.73	5.70	6.5	deposited by E. Gumand au Locle
17	Girard Perregaux à la Chaux-de-Fonds	74685	anc.	spherical	— 1.07	0.50	— 0.17	0.5	4.98	2.05	3.75	5.15	— 0.50	3.0	adjusted by Jacot
18	Ch. Montandon au Locle	21880	bascule	cyl.	— 2.60	0.55	— 0.01	1.9	0.77	2.28	3.38	0.99	0.95	4.5	» Bargstedt
19	Henri Grandjean et Cie au Locle	301001	bascule	d. 2 c. Ph.	— 6.29	0.55	— 0.24	3.2	3.06	6.06	2.64	3.07	9.0	» Jacot
20	Edouard Perregaux au Locle	8795	anc.	0. Ph.	— 2.55	0.59	1.05	3.4	2.62	4.68	2.24	— 3.63	0.23	8.1	» Bargstedt
21	H.-L. Matile au Locle	1685	bascule	cyl. Ph.	— 2.58	0.64	— 0.01	1.5	2.65	4.52	0.62	1.10	— 1.60	5.7	» Bargstedt
22	Sandoz frères aux Ponts	47010	anc.	0. 2 c. Ph.	— 3.05	0.53	— 0.15	8.0	0.05	6.23	1.27	— 2.65	— 1.51	9.0	» Kaurup
23	Girard Perregaux à la Chaux-de-Fonds	67209	anc.	spherical	— 1.16	0.51	— 0.06	3.4	3.15	1.20	1.11	— 3.03	— 3.88	6.6	» Jacot, with key
24	Ulysse Breting au Locle	25313	anc.	H. Ph.	— 0.90	0.57	1.01	0.2	3.40	0.80	1.90	— 0.84	6.4	» Bargstedt
25	Sandoz frères aux Ponts	47010	anc.	0. Ph.	— 5.40	0.62	— 0.20	1.0	2.23	3.23	1.08	— 9.09	— 4.53	9.8	» Kaurup
26	C.-F. Hainzer-Jean au Locle	15442	anc.	0. Ph.	1.50	0.67	— 0.31	— 0.1	1.59	0.49	0.42	— 3.09	5.3	» Bargstedt, 16200 vibrations
27	Ch. Huguenin au Locle	2187	spork. anc	d. Ph.	— 0.54	0.75	— 0.05	— 0.4	1.66	0.04	0.55	0.16	1.62	7.0	» Jacot
28	A. Huguenin et fils au Locle	16533	anc.	d. 2 c. Ph.	— 1.04	0.74	— 0.50	— 0.3	2.44	8.80	3.71	— 4.65	— 0.76	13.1	» perpetual calender, phases of moon
29	A. Huguenin et fils au Locle	16611	anc.	d. 2 c. Ph.	— 1.70	0.82	— 0.20	0.0	2.80	4.01	2.34	— 4.49	— 5.45	9.4	» perpetual calender, phases of moon, adj. by Jacot

TABLE N° 18.

C. — POCKET CHRONOMETRES

observed during one month, in two positions and in the oven.

umber	NAMES OF MANUFACTURERS AND PLACE OF RESIDENCE	Numbers of chronometers	Kind of escapement	Form of hairspring	Mean daily rate	Mean daily variation	Variation between hanging and lying	Variation for 1° of temperat.	Difference before and after the oven	Difference between the extremes of rate	REMARKS
1	Girard-Perregaux à Chaux-de-Fonds	80053	tourb. spring detent	B. Ph.	+ 1,20	± 0,17	− 0,56	− 0,00	− 0,8	1,4	dep. by E. Guinand au Locle, adj. by Jacot.
2	Borel et Courvoisier à Neuchâtel	63027	anc.	B. Ph.	+ 2,21	0,17	+ 1,10	+ 0,08	+ 0,8	2,0	adjusted by Borgstedt.
3	Paul Matthey-Doret au Locle	2236	anc.	B. Ph.	− 0,15	0,17	+ 2,52	− 0,00	+ 0,2	5,2	» » Jacot.
4	Girard-Perregaux à Chaux-de-Fonds	80143	bascule	spherical	+ 2,03	0,20	+ 0,78	− 0,07	+ 1,5	3,0	adjusted by Borgstedt, deposited by E. Guinand au Locle.
5	Edouard Huguenin-Courvoisier au Locle	307	bascule	B. Ph.	− 0,49	0,18	− 3,53	+ 0,01	+ 0,1	4,2	adjusted by Kaurup.
6	Borel et Courvoisier à Neuchâtel	65025	anc.	B. Ph.	+ 0,00	0,20	− 4,25	− 0,18	− 0,9	5,7	» » Borgstedt.
7	Perret et fils aux Brenets	38583	anc.	B. 2 c. Ph.	− 3,70	0,18	− 0,07	− 0,21	− 0,4	7,7	
8	Edouard Perregaux au Locle	8877	anc.	B. 2 c. Ph.	+ 1,57	0,22	− 0,50	− 0,16	+ 1,5	2,7	adjusted by Kaurup.
9	Albert Perrenoud-Gietz au Locle	12113	bascule	cyl. Ph.	+ 5,50	0,21	− 4,10	− 0,20	+ 0,8	7,8	
10	Ulysse Nardin au Locle	5812	bascule	B. Ph.	− 0,73	0,23	+ 0,71	− 0,03	+ 0,1	2,1	made and adjusted by P.-D. Nardin.
11	Victor Siegfried, à Strasbourg	181212	anc.	Breguet	+ 2,12	0,23	+ 1,57	+ 0,15	+ 0,2	5,2	dep. by Jacot frères au Locle, adj. by Kaurup.
12	Ch.-F. Jacottet à Neuchâtel	27188	anc.	B. Ph.	+ 3,41	0,23	+ 3,25	− 0,25	0,0	5,4	
13	Girard-Perregaux, au Locle	70777	bascule	cyl. Ph.	+ 0,40	0,23	− 2,27	+ 0,20	+ 0,1	8,3	with fusee and key, adjusted by Borgstedt
14	Ulysse Nardin au Locle	6123	anc.	B. Ph.	+ 3,53	0,24	− 0,04	0,00	− 0,1	2,5	adjusted by Kaurup.
15	L.-A. Lutz au Locle	90708	anc.	Breguet	− 1,24	0,24	+ 1,21	0,00	+ 1,6	3,1	» » Borgstedt.
16	L.-A. Lutz au Locle	90707	anc.	Breguet	+ 2,48	0,24	+ 0,03	+ 0,30	+ 2,7	4,6	» » »
17	Girard-Perregaux au Locle	67.086	anc.	spherical	+ 8,30	0,25	+ 0,70	− 0,27	+ 0,2	7,7	» » Jacot.
18	Henri Grandjean et Cie au Locle	31484	bascule	B. Ph.	− 1,42	0,25	+ 0,78	0,00	− 0,8	2,3	» » »
19	Edouard Perregaux au Locle	8803	anc.	B. Ph.	+ 0,38	0,25	+ 2,18	+ 0,04	+ 1,3	3,8	» » Borgstedt.
20	Gimel et Othon frères au Locle	20502	bascule	B. Ph.	+ 0,28	0,25	+ 1,04	+ 0,10	− 2,4	4,7	Independant second, with key.
21	Ulysse Breting au Locle	21065	anc.	B. Ph.	− 0,47	0,27	+ 0,05	− 0,21	− 0,3	5,2	adjusted by Kaurup.
22	Albert Perrenoud-Gietz au Locle	12314	bascule	cyl. Ph.	+ 3,08	0,28	+ 2,60	− 0,04	+ 0,4	0,0	
23	F. Borgstedt, régleur au Locle	12999	anc.	B. 2 c. Ph.	+ 1,50	0,28	− 2,58	− 0,20	0,0	0,3	
24	Perret et fils aux Brenets	39582	anc.	B. 2 c. Ph.	− 0,88	0,29	− 2,58	− 0,10	0,0	4,7	adjusted by Borgstedt.
25	Girard-Perregaux à Chaux-de-Fonds	80050	tourb. bascule	B. Ph.	− 2,57	0,29	− 2,05	− 0,25	− 0,5	5,0	dep. by E. Guinand au Locle; adj. by Jacot.
26	Sandoz frères aux Ponts	40120	anc.	B. 2 c. Ph.	+ 4,40	0,29	+ 0,90	+ 0,05	− 0,1	2,4	adjusted by Kaurup.
27	Ulysse Nardin au Locle	5058	anc.	B. 2 c. Ph.	− 1,90	0,29	+ 0,15	+ 0,03	0,0	2,4	made and adjusted by P.-D. Nardin.
28	Girard-Perregaux à Chaux-de-Fonds	63850	bascule	cylindrical	+ 0,03	0,29	+ 0,20	− 0,15	− 0,8	5,5	adjusted by Borgstedt.
29	Henri Grandjean et Cie au Locle	31485	bascule	B. Ph.	− 3,20	0,29	− 5,02	− 0,10	0,0	4,5	» » Jacot.
30	A. Savoie-Keller au Locle	1060	anc.	Breguet	+ 4,50	0,30	+ 0,65	+ 0,02	+ 1,1	3,0	
31	Ulysse Breting au Locle	24053	bascule	B. 2 c. Ph.	+ 1,05	0,30	+ 3,32	− 0,10	0,0	6,4	adjusted by Borgstedt.
32	Paul Matthey-Doret au Locle	2247	anc.	B. Ph.	− 1,52	0,30	− 3,13	+ 0,51	+ 4,5	8,2	» » Jacot.
33	Jacot frères au Locle	188001	anc.	B. Ph.	+ 0,34	0,30	+ 3,00	− 0,17	+ 2,5	8,5	made by Ch. Houriet at the school of horlogery.
34	Henri Grandjean et Cie au Locle	[illegible]	anc.	B. Ph.	− 2,52	0,31	− 3,40	− 0,09	0,0	3,2	10200 vibrations; adjusted by Kaurup.
35	Girard-Perregaux au Locle	74087	bascule	spherical	− 0,22	0,31	− 0,07	− 0,20	− 0,4	6,7	deposited by E. Guinand au Locle; adjusted by Borgstedt.
36	Borel et Courvoisier à Neuchâtel	60013	anc.	B. Ph.	+ 0,04	0,32	+ 2,64	− 0,15	+ 0,0	6,3	
37	Gimel et Othon frères au Locle	23055	bascule	B. 2 c. Ph.	− 0,08	0,33	− 0,55	− 0,11	0,0	2,7	adjusted by Kaurup.
38	L. Lutz au Locle	90710	anc.	Breguet	+ 2,30	0,33	+ 0,55	− 0,18	+ 2,5	3,5	» » Borgstedt.
39	Henri Grandjean et Cie au Locle	15800	anc.	B. Ph.	− 0,05	0,34	− 0,70	− 0,08	0,0	2,5	10200 vibrations; adjusted by Kaurup.
40	Ulysse Breting au Locle	25037	bascule	B. Ph.	− 0,71	0,34	+ 2,23	+ 0,09	0,0	4,1	adjusted by Borgstedt.
41	Sandoz frères aux Ponts	46128	anc.	B. 2 c. Ph.	+ 5,45	0,34	− 0,27	− 0,10	− 1,2	4,3	» » Kaurup.
42	Ulysse Breting au Locle	24068	bascule	B. Ph.	− 0,05	0,34	+ 1,20	− 0,08	0,0	4,5	» » Borgstedt.
43	Paul Matthey-Doret au Locle	2257	anc.	B. Ph.	+ 3,80	0,35	− 0,60	− 0,15	− 2,7	6,3	
44	Paul Matthey-Doret au Locle	2230	anc.	B. Ph.	+ 2,22	0,36	− 0,78	+ 0,07	+ 0,0	2,6	adjusted by Jacot.
45	Borel et Courvoisier à Neuchâtel	55061	anc.	B. Ph.	+ 3,70	0,36	− 0,40	− 0,12	+ 0,2	3,5	» » Borgstedt.
46	Perret et fils aux Brenets	38589	anc.	B. 2 c. Ph.	− 0,23	0,36	− 0,01	− 0,05	+ 3,1	6,0	
47	Edouard Perregaux au Locle	8811	anc.	B. Ph.	+ 0,63	0,36	− 0,83	− 0,18	− 2,8	6,0	adjusted by Borgstedt.
48	Girard-Perregaux à Chaux-de-Fonds	80144	bascule	spherical	+ 0,08	0,36	− 2,70	+ 0,08	+ 0,9	8,0	deposited by E. Guinand au Locle; adjusted by Borgstedt.
49	Girard-Perregaux à Chaux-de-Fonds	74081	bascule	spherical	− 0,33	0,37	+ 0,78	− 0,15	0,0	4,0	» » » » » »
50	Victor Siegfried à Strasbourg	181213	anc.	Breguet	+ 1,52	0,37	+ 0,50	− 0,09	− 1,8	4,2	dep. by Jacot frères au Locle; adj. by Kaurup.
51	U. Humbert-Ramuz à Chaux-de-Fonds	40574	anc.	Breguet	+ 1,35	0,37	+ 3,88	+ 0,19	+ 0,5	5,4	
52	Girard-Perregaux à Chaux-de-Fonds	80133	bascule	spherical	+ 1,00	0,37	+ 1,56	+ 0,10	0,0	5,9	deposited by E. Guinand au Locle; adjusted by Borgstedt.
53	Edouard Perregaux au Locle	8878	anc.	B. 2 c. Ph.	+ 3,15	0,38	+ 2,00	+ 0,02	+ 0,8	3,0	adjusted by Kaurup.
54	Edouard Perregaux au Locle	8879	anc.	B. 2 c. Ph.	− 0,52	0,38	+ 2,21	+ 0,03	+ 0,4	4,2	» » »
55	Girard-Perregaux à Chaux-de-Fonds	70775	bascule	cyl. Ph.	+ 2,71	0,39	+ 0,76	− 0,20	0,0	0,4	with fusee and key, adjusted by Borgstedt.
56	Favre-Leuba et Cie au Locle	22103	bascule	B. Ph.	+ 2,17	0,40	− 2,08	+ 0,02	+ 0,3	4,4	with key, adjusted by Jacot.
57	Paul Matthey-Doret au Locle	2230	anc.	B. Ph.	+ 0,57	0,40	− 1,18	+ 0,28	− 3,0	6,0	adjusted by Jacot.
58	Girard-Perregaux à Chaux-de-Fonds	67081	anc.	spherical	+ 2,13	0,42	− 0,83	− 0,03	+ 1,5	4,0	» » »
59	Ulysse Nardin au Locle	5004	anc.	B. 2 c. Ph.	+ 0,98	0,42	+ 2,58	+ 0,05	− 0,8	4,2	» » Kaurup.
60	U. Humbert-Ramuz à Chaux-de-Fonds	40575	anc.	Breguet	+ 1,70	0,42	+ 3,10	+ 0,35	+ 1,5	6,0	
61	U. Humbert-Ramuz à Chaux-de-Fonds	38258	tourb. bascule	B. 2 c. Ph.	− 0,43	0,42	+ 8,65	− 0,03	+ 1,3	11,5	adjusted by Borgstedt.
62	Edouard Huguenin-Courvoisier au Locle	308	bascule	B. Ph.	+ 1,80	0,43	+ 2,78	− 0,01	+ 0,0	4,0	» » Kaurup.
63	Ph. DuBois et fils au Locle	4315	anc.	B. Ph.	− 0,10	0,43	− 0,65	+ 0,20	− 1,8	5,8	» » »
64	U. Humbert-Ramuz à Chaux-de-Fonds	37342	bascule	B. 2 c. Ph.	+ 2,30	0,43	+ 8,90	+ 0,01	+ 0,0	10,0	» » Borgstedt.
65	Gustave Plantier à Annonay	30240	anc.	B. Ph.	− 2,05	0,44	− 4,60	− 0,06	+ 1,0	3,5	deposited by Guinand-Mayer aux Brenets.
66	Edouard Perregaux au Locle	8813	anc.	B. Ph.	+ 4,80	0,44	+ 4,98	− 0,10	− 4,3	4,8	adjusted by Borgstedt.
67	Henri Grandjean et Cie au Locle	31483	bascule	B. Ph.	+ 1,08	0,44	+ 0,50	− 0,15	0,0	4,0	» » Jacot.
68	Jacot, Matile et Cie au Locle	1060	anc.	B. Ph.	+ 1,10	0,44	− 2,18	+ 0,27	+ 1,7	7,6	
69	Edouard Perregaux au Locle	8812	anc.	B. Ph.	+ 4,07	0,44	+ 6,80	− 0,12	+ 0,8	10,0	adjusted by Borgstedt.
70	Ulysse Breting au Locle	24253	bascule	B. Ph.	+ 0,74	0,45	+ 1,74	− 0,03	+ 0,2	4,5	» » »
71	Perret et fils aux Brenets	38584	anc.	B. 2 c. Ph.	− 1,28	0,45	− 2,97	− 0,24	+ 0,2	5,7	» » »
72	Guinand-Mayer aux Brenets	31841	anc.	B. Ph.	− 2,50	0,46	+ 1,80	− 0,12	− 0,0	6,4	
73	Gimel et Othon frères au Locle	23050	bascule	B. 2 c. Ph.	− 1,04	0,48	− 0,27	− 0,03	− 0,1	2,3	adjusted by Kaurup.
74	Edouard Perregaux au Locle	8655	anc.	B. Ph.	+ 3,80	0,48	+ 4,00	+ 0,05	− 1,4	4,3	» » Borgstedt.
75	Borel et Courvoisier à Neuchâtel	60009	anc.	B. Ph.	+ 0,34	0,49	− 0,94	− 0,15	− 2,0	4,0	
76	Girard-Perregaux à Chaux-de-Fonds	63850	bascule	cylindrical	+ 4,42	0,49	+ 1,75	− 0,23	− 0,7	0,0	adjusted by Borgstedt.
77	Edouard Huguenin-Courvoisier au Locle	309	bascule	B. Ph.	+ 3,88	0,50	− 0,23	− 0,05	− 0,6	2,7	» » Kaurup.
78	Ulysse Breting au Locle	20143	bascule	B. Ph.	− 1,15	0,50	− 0,03	+ 0,00	+ 1,5	3,5	with key, independant second.
79	Ulysse Breting au Locle	23068	bascule	B. Ph.	− 1,03	0,50	− 0,38	+ 0,33	+ 0,7	5,4	adjusted by Kaurup.
80	Henri Grandjean et Cie au Locle	29150	bascule	B. Ph.	+ 8,81	0,51	− 0,08	− 0,02	− 1,8	4,7	
81	Paul Matthey-Doret au Locle	2253	anc.	B. Ph.	+ 1,50	0,51	+ 2,03	− 0,27	− 3,6	10,1	
82	Lebet et Borel à Fleurier	41027	bascule	Breguet	+ 1,00	0,52	− 0,73	+ 0,18	+ 0,1	4,8	
83	Girard-Perregaux à Chaux-de-Fonds	80850	Bohin	B. Ph.	− 1,14	0,53	− 0,09	− 0,11	+ 0,0	4,8	adjusted by Borgstedt, deposited by E. Guinand au Locle.
84	U. Humbert-Ramuz à Chaux-de-Fonds	40558	bascule	Breguet	+ 3,75	0,53	+ 4,70	− 0,13	+ 0,3	7,0	
85	Ulysse Breting au Locle	23050	bascule	B. Ph.	+ 0,50	0,54	− 2,22	+ 0,02	+ 0,5	4,0	adjusted by Kaurup.
86	Girard-Perregaux à Chaux-de-Fonds	78078	bascule	spherical	+ 0,68	0,55	+ 1,34	+ 0,02	− 0,8	3,0	» » Jacot.
87	Girard-Perregaux à Chaux-de-Fonds	80140	bascule	spherical	− 4,02	0,55	+ 6,72	− 0,05	− 0,8	10,1	deposited par E. Guinand au Locle, adjusted by Borgstedt.
88	Jacot, Matile et Cie au Locle	1050	anc.	B. Ph.	− 4,62	0,56	− 0,15	+ 0,20	− 0,0	10,1	
89	Jacot, Matile et Cie au Locle	1051	anc.	B. Ph.	− 0,72	0,58	− 1,05	− 0,08	+ 3,5	5,2	
90	Henri Grandjean et Cie au Locle	29258	bascule	cyl. Ph.	+ 3,02	0,60	+ 3,00	+ 0,34	− 3,0	10,7	with fusee.
91	Paul Matthey-Doret au Locle	2252	anc.	B. Ph.	+ 3,40	0,60	− 4,13	− 0,21	− 2,0	6,4	
92	Victor Siegfried à Strasbourg	181211	anc.	Breguet	+ 4,08	0,60	+ 5,85	− 0,02	− 0,7	8,3	dep. by Jacot frères au Locle, adj. by Kaurup.
93	Edouard Perregaux au Locle	8653	anc.	B. Ph.	+ 1,18	0,60	− 5,18	− 0,33	+ 0,7	11,1	adjusted by Borgstedt.
94	Paul Matthey-Doret au Locle	2234	anc.	B. Ph.	+ 1,41	0,61	− 2,47	+ 0,42	+ 2,0	9,1	» » Jacot.
95	U. Humbert-Ramuz à Chaux-de-Fonds	38150	tourb. bascule	B. 2 c. Ph.	+ 4,73	0,62	− 0,02	− 0,20	+ 1,8	5,0	» » Borgstedt.
96	Paul Matthey-Doret au Locle	2235	anc.	B. Ph.	+ 5,22	0,62	− 0,32	− 0,40	− 4,1	14,5	
97	Sandoz frères aux Ponts	40130	anc.	B. 2 c. Ph.	− 0,78	0,64	+ 1,03	− 0,07	+ 0,5	5,2	adjusted by Kaurup.
98	Henri Grandjean et Cie au Locle	11841	bascule	cyl. Ph.	− 0,41	0,64	+ 3,91	− 0,14	+ 0,4	7,4	with fusee.
99	Ulysse Breting au Locle	20144	bascule	B. 2 c. Ph.	+ 4,77	0,64	+ 3,07	− 0,05	+ 1,1	9,7	with key, independant second, adj. by Borgstedt.
100	Paul Matthey-Doret au Locle	2250	anc.	B. Ph.	+ 5,88	0,65	+ 0,40	− 0,04	− 0,8	4,3	
101	DuBois et LeRoy au Locle	20984	anc.	Breguet	− 0,54	0,65	− 2,24	− 0,12	+ 0,1	3,7	
102	Ph. DuBois et fils au Locle	4310	anc.	B. Ph.	− 6,04	0,66	+ 1,24	+ 0,01	+ 2,0	5,4	adjusted by Kaurup.
103	Jeanjaquet et Cie à Neuchâtel	3906	anc.	Breguet	− 6,64	0,69	+ 3,60	+ 0,38	+ 5,1	8,1	chronographe.
104	John Keller à Lancaster	2203	bascule	cyl. Ph.	+ 5,84	0,69	+ 2,75	+ 0,50	+ 1,1	6,8	deposited by H. Stauffer aux Ponts; adj. by Kaurup.
105	Ducommun-Sandoz et Cie à Ch.-de-Fonds	106988	bascule	B. Ph.	− 5,20	0,70	+ 1,00	+ 0,27	+ 4,4	7,2	
106	Girard-Perregaux à Chaux-de-Fonds	80651	Bohin	B. Ph.	+ 4,02	0,71	− 4,24	+ 0,07	+ 2,4	7,4	adjusted by Borgstedt; deposited by E. Guinand au Locle
107	Paul Matthey-Doret au Locle	2238	anc.	B. Ph.	+ 1,20	0,72	+ 1,60	+ 0,40	+ 5,4	7,4	» » » » »
108	L.-F. Pfister-Droz au Locle	1580	anc.	B. Ph.	− 0,29	0,76	− 0,46	− 0,24	0,0	6,3	10200 vibrations, adjusted by Kaurup.
109	Paul Brelon à Genève	63228	bascule	B. 2 c. Ph.	+ 3,70	0,80	+ 0,80	+ 0,08	+ 2,2	15,0	depos. par C. Hermann et Cie à Neuchâtel; adj. by Borgstedt
110	Girard-Perregaux à Chaux-de-Fonds	80142	bascule	spherical	+ 0,02	0,83	+ 0,64	+ 0,07	+ 0,5	4,0	deposited by E. Guinand au Locle, adjusted by Borgstedt.
111	Edouard Perregaux au Locle	8810	anc.	B. Ph.	+ 2,88	0,84	− 1,00	− 0,40	+ 0,0	8,5	adjusted by Borgstedt.
112	Girard-Perregaux à Chaux-de-Fonds	79080	bascule	spherical	+ 3,22	0,86	− 0,02	− 0,21	+ 0,4	0,0	» » Jacot.
113	H.-L. Matile au Locle	10601	anc.	B. 2 c. Ph.	+ 4,00	0,86	+ 4,87	− 0,18	+ 0,1	11,0	double chronographe, indep. second by back, adj. by Borgstedt
114	Guinand-Mayer aux Brenets	31853	anc.	B. Ph.	+ 2,51	0,88	+ 0,38	− 0,03	− 0,4	6,6	
115	Sandoz frères aux Ponts	54065	anc.	B. 2 c. Ph.	− 0,12	0,89	+ 0,05	+ 0,01	− 0,3	4,0	
116	Ch. Tissot-Favre au Locle	35438	anc.	B. Ph.	− 1,01	0,97	+ 0,80	+ 0,05	− 0,4	5,1	
117	Sandoz frères aux Ponts	44065	anc.	B. 2 c. Ph.	− 0,89	0,98	− 0,82	0,00	+ 2,0	6,0	adjusted by Kaurup.
118	Henri Grandjean et Cie au Locle	11842	bascule	cyl. Ph.	− 0,33	1,12	+ 6,63	− 0,37	+ 1,3	7,3	with fusee.
119	Paul Matthey-Doret au Locle	2255	anc.	B. Ph.	+ 1,78	1,44	+ 4,38	− 0,21	− 0,7	12,0	

D. — POCKET CHRONOMETRES
observed during fifteen days, lying.

Number of rank	NAMES OF MANUFACTURERS AND PLACE OF RESIDENCE	Numbers of chronom.	Kind of escapement	Form of hairspring	Mean daily rate	Mean daily variation	Variation for the temperat.	Difference between the extremes of rate	REMARKS
1	P.-H. Matthey au Locle	11882	anc.	Breguet	− 2.01	± 0.13		0.7	
2	Ekinand frères aux Brenets	11281	anc.	B. Ph.	+ 5.10	0.14		0.8	
3	P.-H. Matthey au Locle	11886	anc.	B. Ph.	+ 0.00	0.16		0.8	
4	Paul Matthey-Doret au Locle	2203	anc.	B. Ph.	− 2.73	0.17		0.7	
5	A. Huguenin et fils au Locle	15095	anc.	B. Ph.	− 1.51	0.18		1.1	adjusted by Jacot.
6	U. Bell à la Chaux-de-Fonds	31490	anc.	B. Ph.	− 5.65	0.20		1.0	
7	Perret et fils aux Brenets	30566	anc.	B. Ph.	− 3.10	0.23		1.5	
8	P. Matthey-Doret au Locle	2260	anc.	B. Ph.	− 1.11	0.23		1.6	
9	Perret et fils aux Brenets	31531	lascade	cyl. Ph.	− 1.52	0.25		1.5	adjusted by Keurup.
10	Girard-Perregaux à la Chaux-de-Fonds	76002	lascade	sphéréind	− 8.80	0.24		1.8	
11	U. Ledoux à Bonillon	25184	anc.	B. Ph.	− 1.30	0.24		1.7	dép. by Gauet et Gisse frères au Locle.
12	Ed. Perregaux au Locle	1102	anc.	B. Ph.	− 5.01	0.28	− 0.18	1.8	adjusted by Borgstedt.
13	Ekinand frères aux Brenets	11234	anc.	B. Ph.	+ 2.17	0.27		1.4	
14	U. Herting au Locle	24243	lascade	B. Ph.	− 2.07	0.27		1.7	
15	Calvin S, Hall, p.ᵉ à Syracuse, N.-Y.	2411	anc.	Breguet	− 5.81	0.28		2.1	
16	G. Bell à la Chaux-de-Fonds	31487	anc.	B. Ph.	− 1.16	0.28		3.3	dép. by Ch. Huguenin au Locle.
17	P.-H. Matthey au Locle	10883	anc.	Breguet	− 1.27	0.32		2.0	
18	H. Grandjean et C.ⁱᵉ au Locle	33191	anc.	B. Ph.	− 3.05	0.28		2.3	striking with min. repet., adj. p.ᵉ Jacot.
19	Ekinand frères aux Brenets	12291	anc.	B. Ph.	+ 1.35	0.30		1.6	
20	L.-A. Lutz au Locle	30561	anc.	B. Ph.	− 1.12	0.30		2.1	adjusted by Jacot.
21	L.-A. Lutz au Locle	30560	anc.	B. Ph.	− 0.24	0.30		2.4	
22	L.-A. Lutz au Locle	30562	anc.	B. Ph.	+ 1.61	0.32		2.1	
23	Perret et fils aux Brenets	12247	anc.	B. Ph.	− 3.05	0.32		3.1	independant second.
24	H. Grandjean et C.ⁱᵉ au Locle	31182	lascade	B. Ph.	− 1.61	0.32	− 0.21	3.4	adjusted by Jacot.
25	Ekinand frères aux Brenets	11860	anc.	B. Ph.	+ 5.01	0.32	− 0.16	8.1	dép. ... Jacot.
26	E. Bornann et C.ⁱᵉ Neuchâtel	38457	lnurla. luse	B. 2.ᵉ. Ph.	− 2.08	0.33	− 0.07	2.1	Borgstedt.
27	Ekinand frères aux Brenets	11888	anc.	B. Ph.	− 5.00	0.33		2.5	Jacot.
28	W.-P. Bingham à Indianapolis	11287	anc.	B. Ph.	+ 4.21	0.35		1.0	
29	W.-P. Bingham à Indianapolis	18891	anc.	B. Ph.	− 7.02	0.35		1.7	dép. by Ekinand frères aux Brenets.
30	Girard-Perregaux à la Chaux-de-Fonds	66347	lascade	sphérical	− 2.05	0.35		8.0	
31	W.-P. Bingham à Indianapolis	11258	anc.	B. Ph.	− 1.03	0.36		2.0	dép. by Ekinand frères aux Brenets.
32	Ch. Olsen et C.ⁱᵉ à Copenhague	11882	anc.	B. Ph.	− 1.59	0.37		1.5	
33	P.-H. Matthey au Locle	10883	anc.	Breguet	− 1.08	0.37		5.8	
34	Calvin S, Hall, p.ᵉ à Syracuse, N.-Y.	2403	anc.	Breguet	− 0.03	0.37		5.0	dép. by Ch. Huguenin au Locle.
35	Ed. Bornann et C.ⁱᵉ Neuchâtel	51245	anc.	B. Ph.	− 1.55	0.38	− 0.30	0.5	adjusted by Borgstedt.
36	J.-A. Jaccard et C.ⁱᵉ à Sainte-Croix	18787	anc.	B. Ph.	− 0.19	0.39		5.4	deposited by F. Borgstedt au Locle.
37	Guinand-Mayer aux Brenets	41745	anc.	B. Ph.	− 1.42	0.40		3.5	
38	Jeanjaquet et C.ⁱᵉ à Neuchâtel	3826	lascade	Breguet	− 1.53	0.40	+ 0.27	4.5	adjusted by Borgstedt.
39	Guinand frères aux Brenets	10894	anc.	B. Ph.	− 3.01	0.41		3.8	
40	Guinand-Mayer aux Brenets	31814	anc.	B. Ph.	− 3.01	0.41		1.5	
41	A.-T. Pister au Locle	11642	anc.	Breguet	− 1.08	0.42	+ 0.38	4.4	adjusted by Jacot.
42	H. Grandjean et C.ⁱᵉ au Locle	31180	lascade	B. Ph.	− 1.02	0.43		1.8	striking with minute repetition.
43	Borel et Courvoisier à Neuchâtel	43073	anc.	B. Ph.	− 1.11	0.44		3.2	
44	Girard-Perregaux à la Chaux-de-Fonds	8784	lascade	spherical	− 0.10	0.44		3.0	
45	Frères Bergeon au Locle	68447	lascade	Breguet	− 0.57	0.45		2.0	
46	Perret et fils aux Brenets	29030	anc.	B. Ph.	− 2.91	0.45		3.0	
47	Nordmann frères à la Chaux-de-Fonds	1010	anc.	B. Ph.	+ 3.01	0.46		3.8	
48	A. Huguenin et fils au Locle	15740	anc.	B. Ph.	− 2.01	0.47	− 0.14	3.8	
49	E. Perregaux au Locle	8915	anc.	B. Ph.	− 1.11	0.48	− 0.15	5.0	adjusted by Borgstedt.
50	P.-B. Matthey au Locle	10881	anc.	Breguet	− 1.21	0.51		5.4	
51	Borel et Courvoisier à Neuchâtel	11878	anc.	Breguet	− 2.07	0.52		3.5	deposited by F. Borgstedt au Locle.
52	J.-A. Jaccard et C.ⁱᵉ à Sainte-Croix	18780	anc.	B. Ph.	− 3.50	0.51		5.5	
53	G. Bell à la Chaux-de-Fonds	31408	anc.	B. Ph.	− 2.77	0.53		6.1	adjusted by Jacot.
54	E. Perregaux au Locle	8301	anc.	B. Ph.	− 3.01	0.54	− 0.14	5.1	
55	A. Perromond Gertz au Locle	12312	lascade	cyl. Ph.	− 1.51	0.56	− 0.37	5.4	young eight days.
56	A. Huguenin et fils au Locle	15740	anc.	B. Ph.	− 0.07	0.57		4.0	
57	A. Huguenin et fils au Locle	15575	anc.	B. Ph.	− 0.17	0.59		4.8	young eight days.
58	Perret et fils aux Brenets	30658	anc.	B. Ph.	− 0.55	0.61		5.5	
59	Girard-Perregaux à la Chaux-de-Fonds	8003	non-Magdalen	B. Ph.	− 2.80	0.62	− 0.00	2.2	dép. by F. Guinand au Locle, adj. by Jacot.
60	P.-H. Matthey au Locle	11891	anc.	Breguet	+ 2.00	0.64		3.0	
61	E. Perregaux au Locle	8710	anc.	B. Ph.	− 1.74	0.82	− 0.25	5.2	adjusted by Borgstedt.
62	Guinand-Mayer aux Brenets	31345	anc.	B. Ph.	− 3.99	0.88		5.8	
63	E. Perregaux au Locle	8736	anc.	B. Ph.	+ 0.02	0.68	− 0.10	4.1	adjusted by Borgstedt.
64	Perret et fils aux Brenets	12916	anc.	B. Ph.	+ 0.11	0.69		7.8	independant second.
65	Ekinand frères aux Brenets	10894	anc.	B. Ph.	+ 1.81	0.69		6.5	
66	Guinand frères aux Brenets	18885	anc.	B. Ph.	+ 1.05	0.71		8.8	
67	Girard-Perregaux à la Chaux-de-Fonds	80055	lon spingrite	B. Ph.	− 2.81	0.70	− 0.07	3.4	dép. by F. Guinand au Locle, adj. by Jacot.
68	P. Matthey-Doret au Locle	2250	anc.	B. Ph.	+ 0.40	0.70		5.4	
69	Ekinand frères aux Brenets	18802	anc.	B. Ph.	− 1.51	0.81		5.5	adjusted by Jacot.
70	P. Matthey-Doret au Locle	2202	anc.	B. Ph.	− 1.51	0.81		7.8	
71	Frères Meyer à la Chaux-de-Fonds	2510	anc.	Breguet	+ 1.95	0.88		5.7	
72	A.-T. Pister au Locle	15035	anc.	B. Ph.	+ 2.03	0.90		3.2	repetition, minute, sec., ¼ sec., adj. by Jacot.
73	Emil frères au Locle	11891	anc.	B. Ph.	− 3.51	0.95		5.4	adjusted by Jacot.
74	U. Herting au Locle	2298	batuile	B. Ph.	+ 3.01	0.90		7.0	
75	Ekinand frères aux Brenets	11311	batuile	B. Ph.	− 1.01	0.97		3.8	
76	P. Matthey-Doret au Locle	2202	anc.	Breguet	+ 3.22	1.00		3.8	
77	H. Grandjean et C.ⁱᵉ à la Chaux-de-Fonds	30528	batuile	B. Ph.	+ 2.78	1.13		5.8	repetition.
78	Perret et fils aux Brenets	10503	batuile	spherical	− 1.41	1.01		11.1	
79	Girard-Perregaux à la Chaux-de-Fonds								

MARINE CHRONOMETRE

Spring detent escapement, cylindrical hairspring with Phillips's curves,
with fusee, going 56 heures, — Nº **94**,

of Henri **GRANDJEAN & Cie**, at Locle.

The sign $+$ in « Daily rate » column signifies slow, the sign $-$ fast.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
October. 7- 8	—0ˢ,93		+15º,3	
8- 9	—0 ,98	—0ˢ,05	15 ,0	
9-10	—0 ,98	0 ,00	14 ,8	
10-11	—0 ,93	+0 ,05	14 ,2	
11-12	—0 ,99	—0 ,06	13 ,5	
12-13	—0 ,96	+0 ,03	13 ,0	
13-14	—1 ,05	—0 ,09	12 ,9	
14-15	—0 ,99	+0 ,06	12 ,5	
15-16	—1 ,03	—0 ,04	11 ,8	
16-17	—1 ,06	—0 ,03	11 ,5	
17-18	—0 ,97	+0 ,09	11 ,8	
18-19	—0 ,92	+0 ,05	11 ,8	
19-20	—0 ,96	—0 ,04	12 ,1	
20-21	—0 ,80	+0 ,16	12 ,1	
21-22	—0 ,99	—0 ,19	12 ,2	
22-23	—0 ,95	+0 ,04	12 ,2	
23-24	—0 ,89	+0 ,06	12 ,2	
24-25	—0 ,98	—0 ,09	12 ,0	
25-26	—0 ,92	+0 ,06	11 ,4	
26-27	—0 ,89	+0 ,03	10 ,6	
27-28	—1 ,09	—0 ,20	10 ,7	
28-29	—1 ,08	+0 ,01	10 ,6	
29-30	—0 ,90	+0 ,18	10 ,2	
30-31	—0 ,87	+0 ,03	10 ,0	
31- 1	—0 ,94	—0 ,07	10 ,1	
November. 1- 2	—0 ,85	+0 ,09	10 ,5	
2- 3	—0 ,88	—0 ,03	10 ,3	
3- 4	—1 ,03	—0 ,15	9 ,9	
4- 5	—0 ,97	+0 ,06	10 ,1	
5- 6	—0 ,86	+0 ,11	10 ,3	
6- 7	—0 ,77	+0 ,09	10 ,4	
7- 8	—0 ,74	+0 ,03	10 ,3	
		—0 ,22		

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
November. 8- 9	—0ˢ,96	+0ˢ,02	+10°,1	
9-10	—0 ,94	—0 ,02	9 ,9	
10-11	—0 ,96	+0 ,02	10 ,5	
11-12	—0 ,94	—0 ,05	10 ,6	
12-13	—0 ,99	+0 ,09	10 ,3	
13-14	—0 ,90	+0 ,13	10 ,4	
14-15	—0 ,77	—0 ,13	9 ,9	
15-16	—0 ,90	+0 ,05	9 ,7	
16-17	—0 ,85	+0 ,70	9 ,5	
17-18	—0 ,15	—0 ,89	31 ,5	in the oven
18-19	—1 ,04	+0 ,18	9 ,8	
19-20	—0 ,86	—0 ,03	10 ,3	
20-21	—0 ,83	+0 ,02	9 ,7	
21-22	—0 ,81	+0 ,03	9 ,4	
22-23	—0 ,78	+0 ,03	8 ,7	
23-24	—0 ,75	—0 ,14	8 ,0	
24-25	—0 ,61	+0 ,09	6 ,9	
25-26	—0 ,52	+0 ,12	6 ,4	
26-27	—0 ,40	—0 ,18	6 ,0	
27-28	—0 ,58	+0 ,08	5 ,9	
28-29	—0 ,50	—0 ,14	5 ,7	
29-30	—0 ,64	+0 ,07	5 ,8	
30- 1	—0 ,57	+0 ,17	5 ,4	
December. 1- 2	—0 ,40	+0 ,10	5 ,0	
2- 3	—0 ,30	—0 ,01	4 ,9	
3- 4	—0 ,31	0 ,00	4 ,7	
4- 5	—0 ,31	—0 ,05	4 ,6	
5- 6	—0 ,36	—0 ,17	4 ,7	
6- 7	—0 ,53		4 ,8	

Mean rate . . . .   —0ˢ,81

Mean variation . . . .   ±0 ,08

Variation for 1° of temperature . . . . .   +0 ,04

Difference before and after the oven . . .   —0 ,19

Difference between the first and the last week   +0 ,57

Difference between the extremes of rate . .   0 ,94

POCKET CHRONOMETER

Anchor escapement, flat Phillips's hairspring, stem winder,
N° **3817**.

of Mr Ulysse **NARDIN**, at Locle.

The sign + in « Daily rate » column signifies slow, the sign — fast.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
October. 6- 7	—1 .4	—0 .2	+15° ,8	Horizontal
7- 8	—1 .3	—0 .1	15 .3	position.
8- 9	—1 .4	—0 .2	15 .0	»
9-10	—1 .6	—0 .1	14 .8	»
10-11	—1 .7	—0 .1	14 .2	»
11-12	—1 .8		13 .5	»
12-13	—1 .8	0 .0	13 ,0	»
13-14	—0 .3	+1 .5	30 .2	In the oven
14-15	—1 .8	—1 .5	12 .5	Horizontal
15-16	—1 .5	+0 .3	11 .8	position.
16-17	—1 .5	0 .0	11 .5	»
17-18	—1 .5	0 .0	11 .8	»
18-19	—1 .4	+0 .1	11 .8	»
19-20	—1 .2	+0 .2	12 .1	»
20-21	—1 .1	+0 .1	12 ,1	»
21-22	—1 .6	—0 .5	12 .2	Hanging.
22-23	—2 .4	—0 .8	12 .2	»
23-24	—2 .2	+0 .2	12 .2	»
24-25	—2 .2	0 ,0	12 ,0	»
25-26	—2 .1	+0 .1	11 .4	»
26-27	—2 .1	0 .0	10 .6	»
27-28	—2 .5	—0 .4	10 .7	»
28-29	—2 .4	+0 .1	10 .6	»
29-30	—2 .4	0 .0	10 .2	»
30-31	—2 .4	0 .0	10 ,0	»
31- 1	—2 .4	0 .0	10 .1	»
November. 1- 2	—2 ,0	+0 .4	10 .5	»
2- 3	—2 .1	—0 .1	10 .3	»
3- 4	—2 .1	0 .0	9 .9	»
4- 5	—0 ,4	+1 .7	10 .1	Pendant to left.
5- 6	—0 .2	+0 .2	10 .3	»
6- 7	+0 .2	+0 .4	10 ,4	Pend^t to right.
		0 .0		

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
November. 7- 8	+0ˢ,2	—3ˢ,8	+10°,3	Pendᵗ to right.
8- 9	—3 ,6	+0 ,3	10 .1	Dial down.
9-10	—3 .3	+1 ,7	9 ,9	»
10-11	—1 ,6	+0 ,1	10 ,5	Dial up.
11-12	—1 ,5	0 ,0	10 ,6	»
12-13	—1 ,5	—0 ,1	10 .3	»
13-14	—1 ,6	+0 ,2	10 ,4	»
14-15	—1 ,4	+0 ,1	9 ,9	»
15-16	—1 ,3	0 ,0	9 ,7	»
16-17	—1 ,3		9 ,5	»

Mean rate . . . . —1ˢ,65

Mean variation . . . . ±0 ,13

Variation for 1° of temperature . . . . . +0 ,09

Difference before and after the oven . . . 0 ,0

Variation between hanging and lying . . . —0 ,81

Variation between hanging and pendant to left +1 ,91

Variation between hanging and pendant to right +2 ,44

Variation between dial up and dial down . . —1 ,99

Difference between the first and last week . +0 ,07

Difference between the extremes of rate . . 3 ,8

POCKET CHRONOMETER

Anchor escapement, flat Phillips's spring, stem winder,

N° **5250**,

of Mʳ **Ulysse NARDIN**, at LOCLE.

The sign + in « Daily rate » column signifies slow, the sign — fast.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
October 6- 7	—1ˢ,2	0ˢ,0	+15°,8	Horizontal
7- 8	—1 ,2	0 ,0	15 ,3	position.
8- 9	—1 ,2	0 ,0	15 ,0	»
9-10	—1 ,2	0 ,0	14 ,8	»
10-11	—1 ,2	+0 ,2	14 ,2	»
11-12	—1 ,0	+0 ,2	13 ,5	»
12-13	—0 ,8	+0 ,4	13 ,0	»
13-14	—0 ,4	—0 ,7	30 ,2	In the oven
14-15	—1 ,1	+0 ,4	12 ,5	Horizontal
15-16	—0 ,7	+0 ,3	11 ,8	position.
16-17	—0 ,4	—0 ,2	11 ,5	»
17-18	—0 ,6	0 ,0	11 ,8	»
18-19	—0 ,6	0 ,0	11 ,8	»
19-20	—0 ,6	0 ,0	12 ,1	»
20-21	—0 ,6	+0 ,1	12 ,1	»
21-22	—0 ,5	—0 ,2	12 ,2	Hanging.
22-23	—0 ,7	0 ,0	12 ,2	»
23-24	—0 ,7	0 ,0	12 ,2	»
24-25	—0 ,7	+0 ,1	12 ,0	»
25-26	—0 ,6	+0 ,3	11 ,4	»
26-27	—0 ,3	+0 ,1	10 ,6	»
27-28	—0 ,2	—0 ,1	10 ,7	»
28-29	—0 ,3	—0 ,5	10 ,6	»
29-30	—0 ,8	+0 ,4	10 ,2	»
30-31	—0 ,4	+0 ,2	10 ,0	»
31- 1	—0 ,2	+0 ,1	10 ,1	»
November 1- 2	—0 ,1	—0 ,4	10 ,5	»
2- 3	—0 ,5	0 ,0	10 ,3	»
3- 4	—0 ,5	—1 ,6	9 ,9	»
4- 5	—2 ,1	—0 ,2	10 ,1	Pendant to left.
5- 6	—2 ,3	—0 ,4	10 ,3	»
6- 7	—2 ,7	+0 ,2	10 ,4	Pendᵗ to right.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
November 7- 8	—2ˢ,5	+0ˢ,4	+10°,3	Pendᵗ to right.
8- 9	—2 .1	+0 ,5	10 .1	Dial down.
9-10	—1 .6	—0 ,2	9 .9	»
10-11	—1 ,8	+0 ,1	10 ,5	Dial up.
11-12	—1 .7	—0 .1	10 .6	»
12-13	—1 .6	+0 .1	10 ,3	»
13-14	—1 .5	0 .0	10 .4	»
14-15	—1 .5	0 .0	9 .9	»
15-16	—1 .5	0 ,0	9 .7	»
16-17	—1 .5		9 .5	»

Mean rate . . . . —1ˢ,40

Mean variation. . . . . ±0 ,14

Variation for 1° of temperature . . . . . . +0 ,03

Difference before and after the oven. . . . —0 ,3

Variation between hanging and lying . . . +0 ,39

Variation between hanging and pendant to left —1 ,74

Variation between hanging and pendant to right —2 ,14

Variation between dial up and dial down . . —0 ,26

Difference between the first and last week . . —0 ,48

Difference between the extremes of rate . . . 2 ,6

POCKET CHRONOMETER

Bascule escapement, flat Phillips's spring, stem winder,
N° **24036**.

of Mr **Ulysse BRETING**, at Locle.

The sign $+$ in « Daily rate » column signifies slow, the sign $-$ fast.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
October. 10-11	—1ˢ.7	—0ˢ.2	+14°.2	Horizontal
11-12	—1 .9	+0 .1	13 ,5	position.
12-13	—1 .8	+0 .1	13 ,0	»
13-14	—1 .7	—0 .1	12 .9	»
14-15	—1 .8	—0 .3	12 .5	»
15-16	—2 .1	—0 .3	11 .8	»
16-17	—1 .8	+2 .3	11 ,5	»
17-18	+0 .5	—2 .3	34 .0	In the oven
18-19	—1 .8	—0 .1	11 .8	Horizontal
19-20	—1 .9	+0 .5	12 .1	position.
20-21	—1 ,4	0 .0	12 .1	»
21-22	—1 ,4	0 ,0	12 .2	»
22-23	—1 ,4	0 .0	12 .2	»
23-24	—1 ,4	+0 .2	12 .2	»
24-25	—1 .2	—2 .3	12 .0	»
25-26	+1 .1	—0 .1	11 ,4	Hanging.
26-27	+1 .0	0 ,0	10 ,6	»
27-28	+1 .0	+0 .1	10 .7	»
28-29	+1 ,1	0 .0	10 ,6	»
29-30	+1 ,1	0 .0	10 .2	»
30-31	+1 ,1	0 ,0	10 ,0	»
31- 1	—1 .1	+0 .4	10 .1	»
November. 1- 2	+1 .5	0 ,0	10 .5	»
2- 3	+1 .5	—0 .4	10 .3	»
3- 4	+1 .1	0 .0	9 .9	«
4- 5	+1 .1	+0 .2	10 .1	»
5- 6	+1 .3	+0 .2	10 .3	»
6- 7	+1 .5	0 .0	10 .4	»
7- 8	+1 .5	+1 .5	10 .3	»
8- 9	—3 .0	0 .0	10 .1	Pendant to left.
9-10	—3 .0	—1 .2	9 .9	»
10-11	—1 .8	+0 .1	10 .5	Pend^t to right.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
November. 11-12	$+1^s,9$	$-3^s,3$	$+10^o,6$	Pend^t to right.
12-13	$-1,4$	$-0,4$	10,3	Dial down.
13-14	$-1,8$	$+0,7$	10,4	»
14-15	$-1,1$	$+0,1$	9,9	Dial up.
15-16	$-1,0$	$+0,1$	9,7	»
16-17	$-0,9$	$+0,1$	9,5	»
17-18	$-0,6$	$+0,3$	9,8	»
18-19	$-0,6$	$0,0$	10,3	»
19-20	$-0,6$	$0,0$	9,7	»
20-21	$-0,5$	$+0,1$	9,1	»

Mean rate. . . . . $-0^s,11$

Mean variation . . . . $\pm 0,13$

Variation for 1° of temperature . . . . . $+0,10$

Difference before and after the oven. . . . 0,0

Variation between hanging and lying . . . $+2,73$

Variation between hanging and pendant to left $+1,79$

Variation between hanging and pendant to right $+0,64$

Variation between dial up and dial down . . $-0,84$

Difference between the first and last week . . $+1,07$

Difference between extremes of rate . . . 5,1

POCKET CHRONOMETER

Spring detent tourbillon escapement, flat Phillips's spring, stem winder.
N° **80643**,

of Mʳ **GIRARD-PERREGAUX**, at Chaux-de-Fonds.

The sign + in « Daily rate » column signifies slow, the sign — fast.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
April 11-12	+1ˢ,1	+0ˢ,4	+ 9ˢ,4	Horizontal
12-13	+1 ,5	—0 ,1	10 ,0	position.
13-14	+1 ,4	—0 ,1	10 ,2	»
14-15	+1 ,3	0 ,0	10 ,0	»
15-16	+1 ,3	+0 ,3	9 ,7	»
16-17	+1 ,6	+0 ,5	9 ,8	»
17-18	+2 ,1	—1 ,3	10 ,1	»
18-19	+0 .8	+0 ,5	26 ,0	In the oven
19-20	+1 .3	+0 ,2	11 ,8	Horizontal
20-21	+1 ,5	+0 ,4	12 ,6	position.
21-22	+1 ,9	—0 ,3	13 .1	»
22-23	+1 ,6	—0 ,3	13 ,3	»
23-24	+1 .3	0 ,0	12 .8	»
24-25	+1 .3	0 ,0	12 ,1	»
25-26	+1 .3	0 ,0	12 ,1	»
26-27	+1 .3	—0 ,2	11 .9	Hanging.
27-28	+1 .1	—0 ,1	12 ,2	»
28-29	+1 ,0	+0 ,3	12 .6	»
29-30	+1 .3	0 ,0	13 ,0	»
30- 1	+1 .3	0 ,0	14 ,0	»
May 1- 2	+1 ,3	—0 ,3	14 .3	»
2- 3	+1 ,0	—0 ,2	13 ,8	»
3- 4	+0 ,8	—0 ,1	14 ,0	»
4- 5	+0 ,7	0 ,0	14 ,1	»
5- 6	+0 ,7	+0 ,1	14 ,4	»
6- 7	+0 .8	—0 ,1	14 .3	»
7- 8	+0 ,7	+0 ,3	14 ,0	»
8- 9	+1 ,0	—0 ,2	14 ,6	»
9-10	+0 .8	0 ,0	15 ,4	»
10-11	+0 .8		15 .7	»

Mean rate . . . . +1ˢ,20
Mean variation . . . . ± 0 ,17
Variation between hanging and lying . . . . —0 ,45
Variation for 1° of temperature. . . . . —0 ,06
Difference before and after the oven . . . . —0 ,8
Difference between the extremes of rate. . . . . . . 1 ,4

POCKET CHRONOMETER

Anchor escapement. flat Phillips's spring, stem winder, — N° **54025**,

of Messrs **BOREL & COURVOISIER**, at Neuchatel.

The sign + in » Daily rate » column signifies slow, the sign — fast.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
October. 20-21	+1ˢ,0	—0ˢ,1	+12°,1	Horizontal
21-22	—0 ,9	0 ,0	12 ,2	position.
22-23	—0 ,9	—0 ,1	12 ,2	»
23-24	+1 ,0	—0 ,1	12 ,2	»
24-25	+1 ,1	+0 ,4	12 ,0	»
25-26	—1 ,5	0 ,0	11 ,4	×
26-27	—1 ,5	+2 ,3	10 ,6	»
27-28	+3 ,8	—1 ,5	34 ,2	In the oven
28-29	—2 ,3	—0 ,5	10 ,6	Horizontal
29-30	—1 ,8	—0 ,1	10 ,2	position.
30-31	—1 ,7	—0 ,1	10 ,0	»
31- 1	—1 ,6	+0 ,1	10 ,1	»
November. 1- 2	+1 ,7	+0 ,1	10 ,5	»
2- 3	+1 ,8	0 ,0	10 ,3	»
3- 4	+1 ,8	+0 ,8	9 ,9	»
4- 5	—2 ,6	—0 ,1	10 ,1	Hanging.
5- 6	+2 ,5	+0 ,1	10 ,3	»
6- 7	+2 ,6	0 ,0	10 ,4	»
7- 8	+2 ,6	+0 ,3	10 ,3	×
8- 9	+2 ,9	+0 ,1	10 ,1	»
9-10	—3 ,0	—0 ,2	9 ,9	»
10-11	+2 ,8	0 ,0	10 ,5	»
11-12	+2 ,8	—0 ,2	10 ,6	»
12-13	+2 ,6	—0 ,2	10 ,3	»
13-14	+2 ,8	+0 ,2	10 ,4	»
14-15	+3 ,2	+0 ,4	9 ,9	»
15-16	+3 ,1	—0 ,1	9 ,7	»
16-17	—3 ,1	0 ,0	9 ,5	»
17-18	+2 ,5	—0 ,6	9 ,8	»
18-19	+2 ,8	+0 ,3	9 ,8	»

Mean rate	+2ˢ,21
Mean variation	±0 ,16
Variation between hanging and lying	+1 ,16
Variation for 1° of temperature	+0 ,08
Difference between and after the oven	+0 ,8
Difference between the extremes of rate	2 ,9

POCKET CHRONOMETER

Anchor escapement, flat Phillips's spring, stem winder, — N° **2235**,

of Mr **Paul MATTHEY-DORET**, at Locle.

The sign + in « Daily rate » column signifies slow, the sign — fast.

DATE.	Daily rate.	Variation.	Mean temperature.	Remarks.
1875				
September 3- 4	0ˢ,0	+0ˢ,2	+18°,1	Horizontal
4- 5	+0 ,2	+0 ,1	18 ,4	position.
5- 6	+0 ,3	+0 ,1	18 ,4	»
6- 7	—0 ,4	0 ,0	18 ,2	»
7- 8	+0 ,4	+0 ,1	18 ,6	»
8- 9	—0 ,5	+0 ,4	18 ,9	»
9-10	+0 ,9	—0 ,7	19 ,5	»
10-11	—0 ,2	+0 ,9	32 ,2	In the oven
11-12	+1 ,1	+0 ,6	20 ,0	Horizontal
12-13	+1 ,7	—0 ,2	19 ,9	position.
13-14	+1 ,9	—0 ,2	20 ,2	»
14-15	+2 ,1	+0 ,3	20 ,0	»
15-16	—2 ,4	—0 ,2	19 ,4	»
16-17	+2 ,2	+0 ,1	19 ,3	»
17-18	+2 ,3	—3 ,4	19 ,6	»
18-19	—1 ,1	—0 ,4	19 ,5	Hanging.
19-20	—1 ,5	0 ,0	19 ,4	»
20-21	—1 ,5	—0 ,3	19 ,5	»
21-22	—1 ,8	+0 ,2	19 ,3	»
22-23	—1 ,6	+0 ,2	18 ,9	»
23-24	—1 ,4	0 ,0	18 ,2	»
24-25	—1 ,4	+0 ,2	17 ,3	»
25-26	—1 ,2	—0 ,3	17 ,3	»
26-27	—1 ,5	0 ,0	17 ,5	»
27-28	—1 ,5	0 ,0	17 ,4	»
28-29	—1 ,5	+0 ,1	17 ,0	»
29-30	—1 ,4	0 ,0	16 ,7	»
30- 1	—1 ,4	+0 ,1	16 ,0	»
October 1- 2	—1 ,3	+0 ,2	15 ,7	»
2- 3	—1 ,1		14 ,6	»

Mean rate . . . . —0ˢ,15
Mean variation. . . . . ± 0 ,17
Variation between hanging and lying. . . . . . —2 ,52
Variation for 1° of temperature. . . . . —0 ,06
Difference before and after the oven . . . . . . +0 ,2
Difference between the extremes of rate. . . . . 4 ,2

Zeichenerklärung.

LOCATION.	DEPARTMENTS.
MAIN BUILDING.	I.—MINING AND METALLURGY.
	II.—MANUFACTURES
	III.—EDUCATION AND SCIENCE.
ART GALLERY.	IV.—ART.
MACHINERY BUILDING.	V.—MACHINERY.
AGRICULTURAL BUILDING.	VI.—AGRICULTURE.
HORTICULTURAL BUILDING.	VII.—HORTICULTURE.

Switzerland not being represented in these buildings, the classes marked —— are to be found in the Swiss Section, *Main Building.*

CLASSIFICATION.

GEBÄULICHKEIT.	DEPARTEMENTE.
HAUPT-GEBÄUDE.	I.—BERGBAU UND METALLURGIE.
	II.—MANUFACTUREN.
	III.—ERZIEHUNG UND WISSENSCHAFT
KUNST-GALLERIE.	IV.—KUNST.
MASCHINEN-HALLE.	V.—MASCHINEN.
AGRICULTUR-HALLE.	VI.—LANDWIRTHSCHAFT.
GARTENBAU-ABTHEILUNG.	VII.—GARTENBAU.

Da die Schweiz in diesen Gebäuden nichts ausstellt, so finden sich alle mit bezeichneten Classen in der Schweizer-Abtheilung, Hauptgebäude.

CLASSIFICATION.

TABLEAU DE

BATIMENT.		DEPARTEMENTS.
		I.—Exploitation des mines et mét...
Batiment Principal.		II.—Manufactures.
		III.—Education et sciences.
Galerie des Arts.		IV.—Les Beaux Arts.
Batiment des Machines.		V.—Machines.
Salle d'Agriculture.		VI.—Agriculture.
Salle d'Horticulture.		VII.—Horticulture.

La Suisse n'étant pas représentée dans ces bâtiments, les classes marquées se trouvent installées dans la Section Suisse du Bâtiment principal.

CLASSIFICATION.